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ABSTRACT

Two papers selected from those presented at the Special Conference on Instructional Technology (San Antonio, Texas, December 1-4, 1970) consider the improvement of special education through instructional technology. The papers examine educational technology as a program objective of the Bureau of Education for the Handicapped (Dale Parris), and the search for better support systems necessary in order to create the tools that will be required in a future special educational system (James Gallagher). Other collections of papers from the conference are available as EC 039 520 (Adoption of Technology and Program Development), EC 039 521 (Instructional Technology for Personnel Training), EC 039 523 (Communication, Production, and Dissemination of Instructional Technology), and EC 039 524 (The Use and Evaluation of Instructional Technology in the Classroom). (CD)

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The Improvement of Special Education through Instructional Technology

Papers Presented at the

Special Conference on Instructional Technology

The Council for Exceptional Children

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PREFACE

The Improvement of Special Education through Instructional Technology is a collection of two papers selected from those presented at the Special Conference on Instructional Technology, San Antonio, Texas, December 1 - 2, 1970. These papers were collected and compiled by The Council for Exceptional Children, Arlington, Virginia. Other collections of papers from the Conference have been compiled and are available from the ERIC Document Reproduction Service. Other collections announced in this issue of Research in Education may be found by consulting the institution index under Council for Exceptional Children or the subject index under Exceptional Child Education. Titles of these other collections are:

The Use and Evaluation of Instructional Technology in the Classroom
Instructional Technology for Personnel Training
Communication, Production, and Dissemination of Instructional Technology
Adoption of Technology and Program Development

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Educational Technology As a Program Objective of the Bureau of Education For the Handicapped

Edwin W. Martin
Bureau of Education For the Handicapped

A recent newspaper story on education for the handicapped and the Bureau programs quoted me as saying that the outlook for education of the handicapped was either depressing or hopeful depending on which set of statistics you chose to look at. While those might not have been my exact words, I think the reporter correctly analyzed the situation in which a handicapped child finds himself in relation to the educational system in the United States.

On the depressing side are the numbers of children being served. About 2.4 million by the latest State count. This 2.4 million represents children now enrolled in special education programming per se, and is about 40% of the estimated 6 million handicapped children of school age. In addition, there are at least one million preschool age handicapped children, and only a very small percentage of these children now receive specialized preschool programming. The projected extra costs for providing special education, using current models, to all these children, is approximately $4 billion. This $4 billion is an extrapolation of current average per pupil excess costs and is only one dimension of a larger problem involving the costs of new facilities for housing such children and the costs of preparing personnel to teach them. In addition, it is probably no news to you that there is a crisis in general school financing. The nation finds itself failing to provide adequate education for its disadvantaged and minority group

children. There is a growing dissatisfaction with the educational system by young people and the public expresses its feelings concerning these matters as related to general economic concerns by increasingly refusing new school support authorizations.

Parents of handicapped children facing the education establishment are told, "We don't have enough money to provide your children with special education." What this means is that a constellation of societal attitudes and assumptions are working against increased educational programming for handicapped children. Included are beliefs that special education does not really work, that it is not really worth the money, that the effect of including handicapped children in school programming will be upsetting or harmful to "normal" children. This combination of fiscal and attitudinal problems have combined so that an analysis of school budgeting will show that extra programming, in a sense educational frills however desirable, has a higher priority for our school tax dollar than does basic educational programming for handicapped children.

On the more hopeful side are the signs that this situation is changing. State after State is strengthening its special education laws. This includes authorizing treatment of new categories of handicapped children, i.e. the multihandicapped, learning disabled, etc., expanding services to the preschool years, or revised services such as resource teacher services. Many States are passing mandatory laws which insist that the State educate its handicapped children.

There is evidence of broader attitudinal change in society itself. The willingness to admit having a handicapped child is increasingly evident. New emphasis on employability of handicapped people and on providing them access to public buildings is emerging. There still is a certain paternalism in our basic approaches, however. We still are in a phase of social evolution where the non-handicapped provide programming to the handicapped out of a spirit of compassion, of generosity. We must evolve another step. The rights of handicapped people are not to be ceded from the haves to the have nots. They are inalienable rights and our systems and our attitudes must reflect an understanding of this issue. Increasingly, the Federal government, through the Congress and the Executive Branch, is coming to appreciate this issue. Federal programming has grown from a million dollars a decade ago to approximately $2000 million at this time. When the Bureau of Education for the Handicapped was established in 1967 about $30 million in Federal educational programming was available. This sum has grown by almost 6000% in the four fiscal years involved, and supports a full range of educational programmings from preschool education through vocational education has been authorized.

A Catalytic Strategy.

Those of us charged with the responsibility for planning and administering Federal programs, beginning during Jim Gallagher's tenure, realized that current Federal funding was going to have little

of any, impact on the education of handicapped children if the expenditure of those funds was based on a per child assumption. That is, even at $300 million, a per child distribution would be of the magnitude of $30. As the average costs of special educational interventions run slightly over $3000, adding $30 per child to the per effort formula provides. Instead, we are developing strategies for encouraging State and local education agencies, and colleges and universities to use Federal funds as a catalyst to change and as seed money to be multiplied by local and State resources.

There is good evidence that the funds are serving these purposes. Colleges and universities, strengthened by Federal fellowship support grants have expanded many fold their capacity to train students. Education agencies have begun projects with Federal funds, then picked them up with State and local funds. In other instances, States have begun programs with Federal funds which were not possible under existing State law, for example preschool programs, or programs for multihandicapped youngsters. Then, they have moved on to change State law to that regard. Here in Texas, Federal funds helped support a massive engineering project which led to a new State law, the new law makes possible many activities previously limited to Federal support and the projected education expenditure for handicapped children this year will rise by approximately $30 million.

In order to make a catalytic strategy work we must look much more carefully at the planning and evaluation processes. We must

be able to delineate, carefully, our objectives in terms of the children we seek to serve, to analyze our expenditures in terms of strategies for meeting those objectives, and, then, to be able to evaluate the effectiveness of our programs against these criteria. When I talked this year with the budget analysts in the Office of Management and Budget they not only wanted to know whether our programs still bring special education to more children, but they want to know what the outcome of those programs is. What are the goals of special education? How much do you want the children to learn, and in what areas? What about employment? I think you know as I do that comprehensive answers to these questions are not now available.

[illegible] operations we have identified six Bureau objectives. They're not very sophisticated. In a real sense they represent our first abstractions at our goals, but they are now articulated, they are quantifiable, and they do provide us a place to begin.

First, by 1978 we have an objective that at least 60% of handicapped children be adequately served by educational agencies. All of us here, knowing the structure of education in the United States and that the ultimate responsibility lies with local and State levels, know that we cannot, in the Federal government, guarantee that objective. Second, it means that our catalytic efforts must be successful, and that a mutuality of planning with State and local agencies, with

colleges and universities is the key to that success. The utilization of new and innovative approaches on a demonstration basis, supported by federal funds, is a key strategy to meeting this objective.

A second objective is to develop models and programs to assist in the reduction or prevention of handicapping conditions by providing relevant early education to 25% of handicapped preschool children by 1973. To meet this strategy, the Bureau is counting on cooperation not only from programs administered by educational agencies, but from day care and Headstart programs across the nation.

By 1976, to develop and promote the installation or adaptation of relevant vocational educational models leading to adequate career training and job opportunities for all handicapped youth. Under the Vocational Education Amendments of 1968, 10% of the funds available to the States must be spent for programming for handicapped children. This money should provide the opportunity for demonstrating the effectiveness of training and the relative employability of handicapped children and youth. Each handicapped child placed in a job that earns a minimum of $3,000 a year represents a quarter of a million dollars gained to society over his lifetime. We contrast his earnings with his cost to society if unemployed or if needing institution care.

A fourth objective also related to 1976, is to provide systems and resources so that significant relevant educational materials

are readily available to teachers of the handicapped so that the objective of providing services to ALL of handicapped children may be reachable. We'll return to this objective in a minute.

The fifth objective is to increase the number of trained personnel, sub-professional and professional so that ALL of handicapped children have adequate instructional and support services. This involves cooperation, once again with other governmental agencies most specifically the Bureau of Educational Personnel Development. Several years ago, Jim Gallagher stated with regard to special education manpower needs, that using current special educational models to reach the children now unserved, the outlook was "you can't get there from here." That still is true if we maintain current assumptions we must change our assumptions.

The sixth objective is to develop programs and practices by 1973 that demonstrably change the attitudes of educational professionals, lay personnel and employers toward greater acceptance and increased realization of the potentials of handicapped children and youth. In the face of it, we know this objective is virtually unmeasurable yet we want to make a particular effort through our program operating philosophies, and through our public information program to bring about societal acceptance of the intrinsic rights of handicapped children.

The Role of Instructional Technology:

As you can readily see, Instructional Technology can play a part in reaching all of these objectives as well as being the central focus of Objective Number 4. One fundamental strategy to the achieving of these objectives must be an increased *effective* participation of handicapped children in regular educational preschool and school programming. The emphasis here must be on the word "effective", for we recognize that a majority of handicapped children are now attending the regular schools in regular classes, but on a sink or swim basis. We in special education must promote as well as capitalize on innovative trends in general education toward individualization of instruction. As one example, I recently visited a school using Individually Prescribed Instruction, and as I watched the children proceeding at varying rates using a variety of materials, with no two children for example in the reading group on the same page or in the same book, it became apparent that educable retarded children could be well served in such a school. I asked the principal whether, in fact, he had educable children in the school and he reported that he *did* and that the *only* problems he had were when a child had behavioral problems as well as retardation. In that particular school there were no resource teachers to help cope with that problem and so the child had to be sent to a special class for emotional disturbed children if an opening was available. In the future one could see the special education program providing a resource teacher, skilled in behavioral modification and other tools for understanding and modifying human behavior, who could

work with the child within that school setting on a continuing or short-term intervention basis. Essentially then, in the past we have insisted that a child complete a certain unit of information within a set time period and a time period was inflexible. For handicapped children this frequently meant that if the child did not learn in the required amount of time he failed and the responsibility rested on him. Under current assumptions, the amount of material may be held constant, but the time made flexible. This time flexibility combined with the careful development of learning materials with objectives that are carefully delineated so that learning moves gradually from item to item toward the objectives, will allow many many more children to experience success and mastery in the school. The focus of the responsibility also is shifted and lies with developing good learning packages and strategies. Failure rests with the educational program and the system and not on the small shoulders of the child. There are obviously a variety of instructional strategies which make individualization more possible. What seems terribly important to me is that we examine carefully the products of individualization in terms of specific behavioral goals. The advantages to the handicapped child in addition to <u>improved</u> instruction is that we may provide him with an educational opportunity that will not be available if we must wait for the special class system to be expanded and developed through additional funding. There are important philosophical gains as well. That is, he may avoid

being labeled and identified as retarded or emotionally disturbed or handicapped at all, and at the same time, receive the special educational attention he needs.

A second major focus of ours lies in the development of a materials and procedures dissemination network. From the catalytic effect of 10 Federal regional or national instructional materials or media centers more than 300 local special education instructional materials centers have now been developed. We are studying the question of what the Federal role should be in relation to these centers. How much of a role should the Bureau of Education for the Handicapped play in encouraging the further development of this network so that it may be evenly distributed across the United States. Some States are now far ahead of others. Should we play a role in establishing the communication links--electronic and otherwise--between centers. In a total system which includes research and development of materials, the analysis and field testing of materials and methods, the dissemination and distribution of these materials and procedures and the ultimate installation of them in classes, what are the best points for targeting Federal resources? In the last year we have commissioned a special task force to help us think through these questions and we are in the process of further detailing that study at this time. This year we intend to include additional input from special education personnel and related specialists as we plan for the evolution of this system and the analysis of the materials that should flow through it.

A third part of the strategy in the instructional technology area is of particular concern to me that is, how we invest our monies which are available under the Captioned Films and Media Services authority, and under our Research authority. It seems to me that we cannot wait for individual researchers to suggest items to us for their study. Instead, we must do a careful needs analysis of the major instructional technology objectives facing special education. With the help of an entire spectrum of the education community from student through professor, we must attempt to come to a priority ordering of major targets. Then our efforts must be focused on a limited number of these targets so that, gradually, year by year, we can sense a positive direction towards our goals. Essentially, I want to be able to answer, as well as I can, for every one of you, questions that you have the right to ask, "How are the Federal dollars we're investing in research and in support of instructional technology, making an impact on the actual learning of handicapped children? Where is the change in special education that results from your efforts? How can it be demonstrated?"

It seems to me that if those of us interested in instructional technology have failed to date, it has been in this dimension. I think we must face that to a large measure we have failed to convince the teachers and the administrators of the educational system, and perhaps more importantly the students, that educational technology is relevant and effective. We hear all too frequently the

horror tales of tape recorders and film projectors that don't work; of equipment and materials that sit in closets unused; of students being bored to death by instructional films and technology. Even though we know that these failures are not the whole picture, that there are many marvelous examples of excellent materials and innovative approaches, we also must ask ourselves why the other attitudes are so common. It seems to me to be at least partially because we have failed to carefully identify the basic questions, and then to proceed toward developing instructional strategies designed to meet fundamental child behavior oriented goals. Perhaps no one has a larger responsibility in this area than the Federal government since, with the possible exception of national professional organizations, no one else has such a global scope or concern.

In conclusion, then, we see a complex problem facing those of us interested in the education of handicapped children. In the United States, equal education for the handicapped is rhetoric, not reality in 1970. We see increasingly clearly that the strategy of providing educational opportunity for handicapped children through the separate classrooms or schools that comprise the majority of the special education programs at this time, does not seem likely to succeed for financial reasons and perhaps for educational reasons as well. Increasingly, we must turn to a more effective regular education. As special educators, we become child advocates saying to the schools, let us help you with your child, rather than saying to them "we have

open arms, give us your poor, your retarded, your disturbing child and we will take him into our special school or class(and off your hands.)

I am not pessimistic about special education and about the American commitment to equal educational opportunity being fulfilled in the final analysis - I am, in fact, optimistic. I think if the instructional technology field will carefully examine its purposes, if it will help establish priorities and delineate national objectives, it can play a key role in achieving this goal.

The Search for the Educational System That Doesn't Exist

James J. Gallagher
University of North Carolina

Many people have remarked that Special Education seems to be at a watershed at this time. It's one of those times where substantial change seems to be in the wind. What we really have to decide is whether the change will be improvement, or just difference. We do seem to be in danger of engaging again in a relatively fruitless discussion similar to the "special class vs. regular class" one, only this time it will be the virtues of a special class vs. the virtues of itinerant teacher-consultee team programs.

In my opinion, what is needed is not any simple shift from one administrative device to another at the local level but a change in the entire system, or ecosystem, so that we can build a concept of continuous improvement into the enterprise itself. It has been noted that the whole educational enterprise faces change in a fashion similar to a hippopotamus rising from the mud of a river bank. The amount of energy that seems needed to accomplish this feat makes you certain that once this change is made it is not likely to occur again for some time. We don't need this kind of convulsive one-shot change in education. What we do need is a better understanding of the system that is required to inject an expectation of continuous improvement into the educational enterprise.

If we accept the proposition that there is no genuine educational system in place today, then we would need to look at what linkages are necessary in order to create the bonds that will be required in a future special educational system. The call for better support systems is not a new one, but the support services themselves need to be organized more effectively than in the past. At the present time, practically all of the

support services seem to emanate out of one undifferentiated multi-purpose organization called the university. The duties of the public about education have enlarged to include the university, as well as the public schools.

While at the Bureau of Education for the Handicapped in the Office of Education, I had a very experienced information officer, Lee Ross, who tried to educate me with regard to the large number of publics that any educator has to communicate with. Some of these publics could be labelled:

General public. This is the aggregate of persons who pay the bill for education, who vote on school bond issues and who get most of their information through the daily paper and the TV.

Influence Makers. This is a group representing the mass media, magazines, local radio stations and the powerful persons who control and distribute information delivered to the general public.

Decision Makers. Here we have a special group of executives and legislators and those people who bring powerful pressures to bear on key executive and legislative departments for the formation or change of policy related to specific problems.

Professional. This refers to the large number of teachers and other educators whose primary purpose is to deliver educational services to children.

Academic. This is the relatively small but influential group of scholars who are in positions of leadership in universities.

It is important to separate these groups in your thinking because each speaks a separate language and has markedly different objectives and methods. Unless we translate from our language into the prime language of the group we are trying to communicate with, we may find ourselves limited

only on the single group that knows how to speak our own tongue. The general failure of the academic community to communicate with the professionals, the decision-makers and the general public may be accounted for, in some measure, by their attempt to talk to them in academicese, instead of becoming multilingual or even of hiring a translator to make sure their messages get across.

Doubts About Education's Ability to Improve

There can no longer be much doubt that the decline and some of the above described publics have grown increasingly skeptical about the values of public education. The sharp increase in school bond rejections, the lack of solid political support for major educational funds, and the new cry for accountability are all symptoms of an important estrangement.

I would like to share with you what I think the reason some of popularity for such terms as accountability, performance contracting and educational vouchers really means. I believe that demands for accountability represent a suspicion that the schools are not doing a good job. Accountability will provide the public with the evidence to support that suspicion. The public seems tired of all the input descriptions - the number of teachers or the curriculum programs or the new plan, and now wants some output figures - in other words, what happens as a result of all of this input. The interest in performance contracting represents a strong public willingness to let somebody else take a crack at the problems that the schools seem to be unable, or unwilling, to deal with. Educational vouchers would give the consumer some control over how he spends his educational dollar and would represent the feeling that a strong carrot and stick approach is needed to force change, since the schools will not reform themselves.

We can all agree that the American educational enterprise like other large and complex entities does not reform itself too easily. With evidence all around us of our inability to provide good education for the disadvantaged, no great changes or modifications seem to be being put into place, or even discussed.

In special education, we have had increasing evidence available to us in a number of special fields. For example, the lack of positive gains for the special class programs for EMR, the limited educational output from either the oral or manual approach for the deaf, the spontaneous remission of most of the functional articulation case load of the speech correctionist without treatment, have not caused a major reorganization of services. Well, why? Is it stupidity, or weakness or self interest that is keeping us from more intelligent programming?

We have a characteristically human way of dealing with such - the decapitation of the guilty. We fire superintendents and chancellors, we elect different public officials in a vain attempt to purge ourselves of the evil and incompetent, and we seek the man or woman on a white horse who will save us. For the sake of simplicity, we should hope that evil men are our root problem but history tells us that it really isn't so. I would propose, instead to suggest an alternative hypothesis to explain the slowness of the educational establishment to act.

WE FAIL TO SOLVE EDUCATIONAL AND SOCIAL PROBLEMS BECAUSE WE ARE NOT ORGANIZED AS A SOCIETY TO SOLVE THOSE PROBLEMS.

The Educational Non-System

The "American Educational System," as a concept, is both a misnomer and an overclassification. First, we don't have a true system in the usual

sense of that word. A system requires a combination of elements functioning in a relationship to one another. We have an educational tradition that stresses autonomous units and self-contained operations rather than interactive, mutually responsive elements. There is both strength and merit in the American educational tradition of diversity but the unique demands of today and beyond require that we forge a system that can relate effectively to continuous new developments, while preserving the best of what we now have.

A communications system or telephone system illustrates this linkage. Our school districts and other education organizations very often operate in a manner that would indicate apparent unconsciousness of the very existence of one another. Most districts still operate as isolated service units that have evolved from local practices. Above all, they rarely plan ahead, suggesting instead from one release to another.

The current educational emergence based, to considerable measure on decision-making at the local level, has leaders who are not in a position or who do not have the authority to make major modifications affecting major system problems.

A recognition of these problems has led to increasing pressure on schools to begin to adopt some form of program planning and budgeting. We don't need to go very far to search for useful applications of planning principles to special education. Let us take a quick look at some of the areas - emotional disturbance, learning disabilities and mental retardation. The Bureau of Education for the Handicapped recently provided us with some highly provocative national statistics, drawn from reports of state departments of education and university training programs.

In the area of emotional disturbance using a most conservative incidence figure of 2% there are approximately 1.2 million disturbed children (ages

5-19) in need of special services in the United States. If we decided to provide full special education service to all children, we would be able to determine how many professionals we would need by establishing the accepted staff-child ratio. With the usually accepted 8 to 1 staff/student ratio we would need 150,000 specialists. But let us continue in our conservative mode and say that we will settle for giving special service to only 60% of the emotionally disturbed children by 1975. That means we will need only 90,000 specialists, not 150,000. How many do we have now? About 11,000, so we are short about 79,000 specialists.

Insert Figure 1 About Here

At this time, we can begin discussing money. If the federal government would only relent and give more money for training, maybe the problem will be taken care of? Let's see if that is so - is money the problem? How many students are being turned out a year as specialists in this area? Using some estimates that for every federal fellow there are two graduating from MS programs without support, and four in undergraduate programs, we can estimate a total of 500 specialists per year are being graduated. Using 1970 as a base, it will take 158 years to meet the demand for personnel to provide service to 60% of the emotionally disturbed. Or by the year 2130, we will be providing special services to 60% of those children that need it in this area.

But wait a minute, - we haven't figured in yearly manpower attrition rates. We should expect to lose about 8% of the work force in any year through death, retirement, pregnancies, etc. Eight percent of the existing work force is about 900 persons. Since we are only turning out 500 a year, we aren't even getting our wood back. Doubling the program output at the

federal level may allow us to break even. It should be obvious that we can't begin to meet our professional responsibilities that may arise. So we really wish to support a manpower strategy that won't satisfy minimum educational needs even while our descendants are exploring the solar system and nearby universes in the year 2170?

Perhaps the emotionally disturbed are a special case - let us take learning disabled children in a similar analysis. Again, using the most conservative figure available for incidence, 1%, we arrive at 600,000 children, ages 5-19, needing service. At a service ratio of 20 to 1, much higher than most experts would allow, we need about 14,000 more trained specialists to provide service to 60% of those that need it. Best figures now available suggest there are just about 9,000 specialists are now at work so we need to more than double the existing supply of trained personnel.

How many are our training programs turning out? We now estimate a maximum of about 600 "Master Degree plus" specialists will be turned out in this area each year, and we can further estimate an attrition of seven hundred. So you see, we are really not much better off. By doubling the existing capacity and assuming a reasonable attrition, we can meet our criterion of service to 60% of these children in about 200 years.

The situation cries out for a new approach. Each of us cannot have his own shoemaker or tailor and it appears that each child who needs help cannot have his own special teacher either. Can media and technology help? It had better. The old crafts and guild approach to special education is the victim of a numbers game it can't win. Similar figures can be easily calculated on the delivery of health and legal services by current models. There is no way for existing medical schools with their existing philosophies to turn out personnel to meet any acceptable standard of health care to all

of our citizens. In all of these endeavors we must seek major innovations - new ways of organizing the delivery of services - with greater use of technology and new manpower models.

As we consider what is needed to unfold technology and media into the future plans of education, it would be well to make some estimate as to why the earlier enthusiasm with such devices as computer assisted instruction and programmed learning and the whole range of audiovisual devices so quickly evaporated. There are a score or more of companies still nursing their bruises from an earlier assumption that there was a rich and expanding market for all sorts of educational technology.

A recent report on the Commission on Instructional Technology has some pertinent things to say on this issue. This report was received with limited enthusiasm by the current administration for a number of reasons, not the least of which was that the report called for some substantial expenditures (about 1/2 billion), at a time when the administration was trying unsuccessfully to balance a budget by controlling discretionary funds in education and health and welfare.

The report[1] says among other things that

> 'Our study has shown that one-shot injections of a single technological medium are ineffective.....
>
> Technology, we believe, can carry out its full potential for education only insofar as educators embrace instructional technology as a system and integrate a range of human and nonhuman resources into the total educational program.' (page 7)

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[1] To Improve Learning, Report of Commission on Instructional Technology, Committee on Education and Labor, House of Representatives, 1970.

One can agree with the above statement and also with the more flamboyant, but probably correct, statement

> The changes required will probably be as thoroughgoing as those which industry underwent when it shifted from hand labor to mechanization. But a society hurtling into the age of the computer and the satellite can no longer be held back by an educational system which is limping along at the blackboard-and-textbook stage of communication.

But how is this change to be done? It is the engineering problem, as much as the creative future vision, that defeats us.

Needed Support Systems

What is it that is needed to provide the components of a continuous improvement program? Many people despair of such discussions because the cost is considered too great. Some five years ago, I observed that the American public will pay for anything that they consider is sufficiently entertaining, important or threatening. Education's problem is that it hasn't convinced the various publics that it is any one of those three.

There is one example in our own experience of the full acceptance by our society of the need for complex systems in order to get a complex job done. Unfortunately, and it probably says something about our current society, our best illustration is in the area of the military. When we send an infantry platoon or company out into the field, those men are backed up by a mass of complex systems, all of which are working together to maximize the impact of that infantryman in the field. There is an involved supply system and a Quartermaster Corps to make sure that he has all of the materials and the ammunition he needs; there is a complex intelligence system manned by specialists continually feeding back information on the infantryman's own situation and on the situation of the

people he has to meet in the field; there is a major communication system which links that operating unit with others in the field so that they can adjust their own performance accordingly, etc. In total, the support troops far outnumber those troops on the line.

No matter how good that infantryman is, he is not likely to perform his tasks well unless all of his support systems are working effectively. To say that the infantryman is the most important part of this whole complex operation is a half truth. It is certainly true that he must be competent, or all of the other support systems will not help. On the other hand, if the support systems are not there he can very easily lose his battle or his life, not because he lacks courage or initiative, but because he has not been backed up with enough of the resources needed to do the job.

I believe there is a direct analogy to education. In most cases it is all to clear that the educational support systems necessary to get complex tasks done are not there. It is a half truth to say that the classroom teacher is the most important person in education. Of course the classroom teacher is important, and all the educational support systems in the world filled with communications, new curriculum materials, feedback information on student performance, will not be worth anything unless the teacher is competent. But just as the infantryman can fail because he is not backed up with good support services, so can the classroom teacher fail if he is not backed up with good support services.

NEEDED SYSTEM ELEMENTS

Let me sketch a few of the needed system elements, as I see them.

1. Planning and Evaluation - One of the essential elements in an effective educational system would be the ability to plan nationally and have some means of getting continual output on the results of current programs. It is too much to ask that each small school system would have such special personnel to conduct evaluation studies, collect data on program impact and project program needs and costs over an extended period of time. But the technology of the computer clearly makes it possible for us to store and retrieve information much more easily. Such activities are not beyond the scope if the large municipal school districts, regional service centers such as we now see developing in Texas or state education departments. They, and the Office of Education must have such planning capabilities and their information systems must be compatible so that data collected in one community can be aggregated with information collected in another. The building of usable information systems that meet local, state and federal needs is a painful process, but it is now underway, stimulated by the Office of Education, and can be a useful tool to all of us if there is an assignment of personnel to the administration of this task.

Perhaps one of the most important moves that some state departments of education, and some school systems, have made has been their development of planning and evaluation units within the major school organization. When there are individuals in the school system who have the responsibility for generating a clear statement of objectives, for costing out the needed resources to achieve those objectives, for helping decision-makers to identify alternative educational strategies, and finally to determine

whether the school system has reached their objectives, then they can produce a major addition to the systemization of our educational effort.

Such a planning and evaluation effort could be of great value to special education in such new ventures as the current push to resource room services. No state can instantly change over from one educational pattern to another, or even have the data available to make plans or allocate resources rationally, without a good planning and evaluation service.

Such planning has to have an objective. Let us say that 60% of the target population of children to be served will have service from trained personnel by 1975. We now want to answer such questions as:

How many trained personnel are exist?

How many persons need training to meet the additional needs?

How many training institutions do we have to provide these services?

What will the cost of such training be? (cost in terms of personnel and cash)

How will the costs change from year to year?

A pencil and paper and some assumptions can provide you with a rough portrait. The responsible decision-maker will want much more precision than that. Let us take a simple example -

A rough needs analysis in the state of North Carolina would reveal a minimum of 60,000 children of school age who could be labelled educably retarded or learning disabled or emotionally disturbed. Let us assume that the resource room concept would be implemented so that services would be provided for these children in the general resource room setting in the school. As a first step, we find out how many of these children are now under the care of a trained professional, and calculate how many more will need to be trained.

Using a simple goal of 60% service, and a 20 to 1 staff/student ratio, we will need to train about 1500 more professionals to be resource room teachers. With about eight existing special education training institutions in the state, putting out a maximum of 240 specialists a year, almost all in CMR, we will need to add substantially to training resources if we are to stand any chance of attaining our modest goal.

Realistically, three strategies lie open to us. The first strategy would be to retrain existing elementary school teachers for the role of resource room teachers. Since, there are supposed to be a projected surplus of elementary school teachers of about 250,000 by 1975 it would seem to be a good manpower pool to tap.

Second, we could retrain existing special education teachers out now certified for the role of diagnostic teaching, and the counseling of other teachers that would be required in the new organization of resource rooms. A good special education teacher would probably take less time to train in this approach, but we would probably be merely shifting one person to fill one vacancy while we created another where he or she came from.

Third, we could attempt to recruit more resource teachers from the preservice programs by helping the universities to reorient the nature and direction of their preservice programs. Each of these strategies are going to cost substantial sums of training money. Using the most conservative of figures, it should cost about 2.5 million dollars to provide the 1500 additional personnel needed to deliver a quality level of service to 60% of those students who need it. This cost is strictly the cost of training these additional persons and must be provided by the state or federal government if any type of quality is to be expected.

If a major psychological barrier to such planning exists among educators it is first, Who does the planning? and second, Do I really want outsiders collecting information on my operation? First of all, we should make clear that a planning office does not do the planning for a state or a region or a city. They provide the necessary information and projections to allow the responsible decision-makers, whether he be the superintendent or director of special education or whoever, to have better data available. Major representation of local interests have to be provided in the establishment of regional or state objectives and in the designing of the strategies to meet these objectives. In terms of not wanting anybody to see my operation, those days are over. The public wants to know what it is getting for its money and will demand educational accountability from special education and from all education.

There are some fundamental truths that are well known to people who work in special education that are practically unknown to the general public. I suppose that each profession, whether it be medicine or law or whatever, has such general understandings within the profession. One of these general understandings has to be made clear to our clients and to the general public as we pursue the whole matter of accountability.

> It is extremely difficult to modify the established patterns of behavior or performance of children and the more severe the problem the child has the greater the difficulty of modifying his performance.

This general principle is not big news to people in Special Education - it is big news to the general public because educators have not only not told them this fact directly, but they have implied that, given sufficient money and resources, there is hardly anything that is not possible within the framework of education.

It's important to recall that I said it is very difficult to change the established patterns of children - I did not say it was impossible. It is possible to modify adjustment patterns of an emotional disturbed child so that he becomes functional in our society, but it is not easy and will cost a great deal in both personnel resources and money. It is possible to change an unmotivated frustrated educable retarded child into an effective participant in our society, but it isn't easy and it requires a great deal of personnel resources and money. We need to tell the public the true nature of the educational task, not as an excuse, but as a way of presenting what the realistic expectations are. Our reach should always exceed our grasp, and we should always be trying to do better than we have done, but we need to be much more precise as to what we finally expect to happen as a result of our efforts.

Even if these manpower needs are sorted out properly, it will be doubtful if long range improvement will be obtained unless other system components are put into place. What is needed to provide the teacher with the same type of support system backup that we provide for infantryman?

Training

I have already discussed the problems inherent in some of our special education manpower development programs. The isolation of these programs from the consumer and the lack of feedback on the training programs' effectiveness have caused their program design to reflect more the inner processes of the training institution - the university - than the needs and demands of the marketplace. New linkages have to be forged which will integrate training with the other activities in the total system. The university training programs need to be more responsive to state and national manpower needs on one hand, and have more of a say in major state planning on the other.

I have previously suggested the establishment of consumer advisory committees for university training programs as one means to provide needed consumer feedback to the trainers. This proposal has been met with embarrassed silence within the university community. Major school units, such as large cities or regional centers used to have a training program and staff of their own to handle inservice, demonstration and practicum supervision activities. The basic service unit itself must take responsibility for its own on-the-job training, while the universities concentrate on advanced training of those who will direct the inservice efforts. This local training unit would provide another linkage with the university based training program.

Those with major responsibilities in training should be required to spend every third summer or more in refresher courses on the newest developments in such areas as curriculum and media development so that a continuing linkage is formed between research and development and training. In some fashion or another, we need to break through the remote castle-on-the-hill concept of training institutions that has been our history, and substitute system linkages that tie it to our other components.

Research and Development.

We will need a much more sustained and expanded support of Research and Development in education than has been true in the past. We have already heard suggestions for a set aside of 1 to 2% of the local educational budget that would be used for design and developmental efforts at the local level. This is a good move, but it will not pay off unless we can establish the research and development activity as a key component of the local organizational structure. Until the local school unit becomes

involved in developmental activities, they will not likely be receptive to those activities done elsewhere.

We must support the major research institutions; institutes, centers and laboratories that will provide a sustained and extended attack on the wide variety of complex educational problems still plaguing us. It seems likely that such major support will have to come from the federal government. President Nixon's proposal for a National Institute of Education that would be the central focus of federal expenditures of educational research and development money would seem to have some genuine promise, if the budget that accompanied the establishment of that Institute could be raised to 1% of the total educational expenditure instead of the .4% that now exists.

We need a much greater recognition among our public policy-makers about the long-term nature of research and development and the fact that a substantial number of the efforts that will be undertaken will not produce anything of a momentous character. We accept this fact in the biological sciences - we do not expect every investigator seeking a vaccine for polio or rubella to discover it.

I recently listened to the two scientists who discovered the new rubella vaccine describe their efforts which took an extended period of time and resources. The successful vaccine was obtained after a few hundred other efforts had proven unsuccessful. If they had been called before a congressional committee after they had tested 100 possible vaccines, we might have said that their research was a failure and not worth supporting. We need to have the same long-term tolerance for research work in education, that we accept wisely in the medical sciences.

In those areas such as media and technology, large investments need to be made over an extended period of time to test major new delivery system concepts in education. In this respect, the consumer needs to have much more say on what major objectives are undertaken than he now has. We are inclined now to consider the success of Sesame Street as a foregone conclusion and to say that the $8 million to produce the first set of programs and the larger amount being asked for the second series, is well worth it.

But at the time of the initial commitment of funds, it was not at all certain that you could teach young children by television with the use of commercial-type jingles. It was an act of some administrative courage to commit such a large sum of money on such an untried project. It does not take much imagination to think of the fun critical Congressmen or critics of education could have had with such a financial commitment, if the project hadn't worked out well.

Perhaps the greatest need that research and development in education has, besides some faith on the part of the decision-makers, is a means of translating their activities and results into educationally usable information to the teacher. This may well require another component in the total system.

Educational Communication Centers

Another substantial system need is a local educational communications center. Here we need to have persons in the school system who are committed towards the distribution of new ideas and new materials, who are in direct communication with research laboratories and centers and training institutions, so that the latest in new materials and procedures

are systematically delivered to the teachers who are on the firing line. This means much more than a traditional library or materials center where the staff waits passively for somebody to come and get the materials or equipment. It means a very active role of demonstrating, of short-term training, of providing not only information but the requisite skills so that the materials can be used in the framework of the teacher's own personal situation.

The Special Education Materials and Media Centers concept is one of the most innovative and useful ideas in all of education. We need to build on these initial efforts so that a truly effective communication network is available. One of the prospective activities of the Frank Porter Graham Child Development Center at U.N.C. would be the establishment of such a communications center for early childhood programs.

Demonstration Centers of Excellence.

As one final component in an effective educational system, we need to demonstrate the best of what we now know in our various speciality areas. We could support, for five years, various Centers of Excellence within states and regions that would illustrate the best of how and what we know now in terms of educating the gifted, the mentally retarded, the emotionally disturbed, the deaf, the blind, etc. It is very difficult for administrators charged with the parcelling out of state funds to pick out one or another area or community in the state for special attention. The easy way, and the way which is often almost mandated by state law or regulations, is that everybody should get the same amount of resources. In a practical matter, what that means is that everybody starves a little bit, and nobody is able to demonstrate how much benefit a well-fed program can provide.

The advent of federal funding does allow the states to pursue this goal of Centers of Excellence. I can think of no better or more constructive use for these additional funds than to suggest that they provide enough resources for a particular program that can truly demonstrate what is possible under good circumstances, rather than under marginal circumstances.

Anyone who takes on the task of sketching out what ought be be, rather than what is, always runs the risk of being accused of so much fantasy. The hard-headed practical man will always say, who will pay for all of these new system components? We have trouble even getting enough pencils for our teachers, much less fancy communication centers, research and planning units and so forth.

We might better approach such an issue from another direction. One estimate that has been made on the total cost of the educational enterprise in the United States is about 60 billion dollars a year; far more than any other activity except for national defense.

Since we are investing this staggering amount of money now - the proper question is how much are we willing to spend on:

1. Research and development to provide us with more effective programs and procedures.

2. Training activities to guarantee quality manpower.

3. Demonstration activities to illustrate new and better programs.

4. A planning and evaluation effort that would help allocate those sums wisely.

5. And a Communications system designed to help educators keep in touch with new developments.

Even the most enthusiastic cost estimates of the specialists in any of these activities could amount to a miniscule fraction of the total

60 billion now being expended. We ask for and need the same support for the frontline teacher that we provide for the frontline infantryman. The critic who doesn't like these suggestions must still come up with some answers of his own to these issues that have been outlined here.

If we expect to get such resources, we educators in turn must be willing to become accountable, to be more responsive to consumer needs, to communicate to all of our publics, and to bear the anxieties and frustrations that will be an inevitable companion to the establishment of a modern educational system. But we will be better off if we accept the philosophy of the late Robert Kennedy who said so often,

"Some men see the world as it is and ask, 'Why'
I dream of things that never were and say, 'Why not?'"

SPECIAL EDUCATION MANPOWER NEEDS - ESTIMATION

Needed Information		National Current Model Emotionally Disturbed	National Current Model Learning Disabilities	North Carolina Resource 23-002-13
Children Needing Services (ages 3-19)		2% 1,200,000	1% 600,000	90,000
Children Now Receiving Special Services		90,000	120,000	11,000
Trained Professionals Available		11,000	9,000	650
Professionals Needed to Meet 60% of Need		8 to 1 Ratio 79,000	120 to 1 Ratio 14,000	120 to 1 Ratio 1,500
Existing Training Institutions		About 40	About 30	About 0
Current Output of Training Institutions		About 3000	About 4000	About 240
Maximum Capacity of Training Institutions		About 10000	About 8000	About 600 + Remaining Elem. 300
Years to Criterion - Maximum Capacity (60% Goal)		79 years Year = 2049	33 years Year = 2003	4 years Year = 1994
Years to Criterion (8% Attrition)	Current Support	Never	Never	Never
	Maximum Support	Over 800 years	Over 200 years	8-10 years